

PATENT ABSTRACTS OF JAPAN

(11)Publication number : 10-113362

(43)Date of publication of application : 06.05.1998

(51)Int.Cl.

A61F 13/54

A61F 5/44

(21)Application number : 08-272646

(71)Applicant : OJI PAPER CO LTD

(22)Date of filing : 15.10.1996

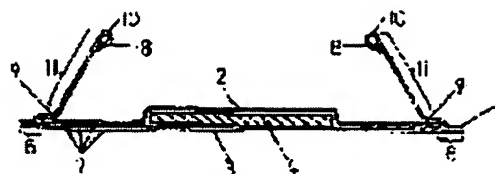
(72)Inventor :
OGISO KOJI
IJIMA SHIGEMI
NAKAZAWA SACHIKO

(54) DISPOSABLE DIAPER

(57)Abstract:

PROBLEM TO BE SOLVED: To heighten a weir of a three-dimensional gather, and increase capacity of a pocket formed of the three-dimensional gather by arranging the three-dimensional gather by having a standing-up line outside of plural leg surrounding elastic bodies of a side flap, and making the three-dimensional gather easily stand up by elastic shrinkage force of the leg surrounding elastic bodies.

SOLUTION: A side sheet 5 is arranged along a surface of a top sheet 2 to cover an absorbing body 4 from the side edge of a back sheet 3 extending to the outside from both side edges of the absorbing body 4 in a disposable diaper, and a part positioned on the top sheet 2 of this side sheet 5 is adhered to the top sheet 2 along the lengthwise directional total length of the diaper in both side edge parts of the top sheet 2. In a part positioned on the absorbing body 4, an elastic body 8 is bent so as to wrap in its side edge part, and lengthwise directional both end parts are adhered on the absorbing body 4 through an adhesive part. Therefore, an upward standing-up three-dimensional gather 11 using an adhesive part in both side edge parts of the top sheet 2 as a standing-up line 9 is formed.



LEGAL STATUS

[Date of request for examination]

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's
decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's decision of
rejection]

[Date of extinction of right]

Copyright (C); 1998,2003 Japan Patent Office

BEST AVAILABLE COPY

* NOTICES *

Japan Patent Office is not responsible for any damages caused by the use of this translation.

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. **** shows the word which can not be translated.
3. In the drawings, any words are not translated.

CLAIMS

[Claim(s)]

[Claim 1] The top sheet of liquid permeability, the backseat of liquid impermeability, and the absorber arranged among said both sheets, In the usage **** diaper which has the solid gathers arranged at the longitudinal direction along with the absorber side edge on the side flap which has the circumference elastic body of two or more feet which extended outside, and a side flap from the longitudinal direction edges on both sides of said absorber Said solid gathers are usage **** diapers characterized by having a standing-up line and being arranged besides the circumference elastic body of two or more feet of said side flap.

[Translation done.]

* NOTICES *

Japan Patent Office is not responsible for any damages caused by the use of this translation.

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. **** shows the word which can not be translated.
3. In the drawings, any words are not translated.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention is making it easy to start solid gathers simple by the elastic recoil of the circumference elastic body of a foot in more detail about a usage **** diaper, and it relates to the usage **** diaper used suitably while it makes the weir of solid gathers high, enlarges capacity of the pocket structure which solid gathers form and prevents leakage.

[0002]

[Description of the Prior Art] The well-known usage **** diaper which is one of the absorptivity goods has composition which has arranged the absorber which consists of a curdy pulp and high absorptivity polymer (it is called Following SAP), a hydrophilic sheet, etc. between the top sheet of liquid permeability, and the backseat of liquid impermeability, and urine is absorbed by the absorber through a top sheet. In recent years, steps, thin-shape-izing, and miniaturization progress from a viewpoint of reduction of the ease of using, and physical distribution cost, and a disposable diaper reduces the operating rate of the curdy pulp with the large volume used for the absorber as the result, and is in the inclination for the volume to increase the rate of small SAP with a large absorption capacity. However, since the rate of SAP which absorbs urine and body fluid is slow, the rate (henceforth rate of absorption) which absorbs urine and body fluid from a top sheet became slow, therefore the problem that urine and body fluid begin to leak from a disposable diaper has produced the usage **** diaper which consists of thin absorbers with the high rate of SAP.

[0003] In order to solve these points, arranging a flap on the outside of an absorber has been proposed. Namely, the gasket cuffs with which it extended outside from the opposite side total of an absorptivity core, and the elastic member was attached between the top sheet of liquid permeability, and the backseat of liquid impermeability like the publication to JP,6-93901,B, It has the barrier cuffs which start from the branching edge by the shrinkage force of the elastic member which branched from the top face of the gasket cuffs in the inside of an elastic member, respectively, and was attached in the free edge, and have a sex. The pocket section is formed between the top sheets on an absorber, and the diaper which measured leakage prevention is known.

[0004] Moreover, the 1st liquid barrier flap with which it extended outside from the opposite side total of an absorptivity core, and the elastic member was attached between the top sheet of liquid permeability, and the backseat of liquid impermeability like the publication to JP,4-297256,A. It has the 2nd barrier flap which branches from the top face and has elastic shrinkage characteristics. The diaper with which a streak of 1st elastic member was attached along the branching edge of the 2nd liquid barrier flap, it estranged with the 1st elastic member inside the branching edge, and a streak of 2nd elastic member was further attached in it at least is known.

[0005]

[Problem(s) to be Solved by the Invention] Since the diaper given in above-mentioned JP,6-93901,B has fallen without having only moved the flap to the absorber inside simply, and a flap standing up to an absorber side at the time of wearing, the role of the anti-leak barrier to urine or a loose passage may be unable to be played. Moreover, since it fell in the direction of the inside and has stood up in feeling, even if it has stood up with sufficient fate, when the capacity of the pocket section decreases and a lot of urine is excreted, it will leak to the outside of a diaper, without urine being temporarily securable. Moreover, in order to enlarge capacity, when flap width of face was made large, there was a trouble that wrap area became [a flap] large about an absorber, and an absorption field became extremely narrow.

[0006] Moreover, a diaper given in JP,4-297256,A which arranged the elastic member under the standing-up line of the above-mentioned solid gathers In order to consider as the solid gathers which fixed the height of the weir of not only the solid gathers of a length-from-the-crotch-to-the-cuff part important for the leakage of a longitudinal direction but the whole On the production process, in order to divide a flexible elastic body into 2 times and to attach it in the body of a diaper, the routing increased, and further, in order to arrange the standing-up line of solid gathers on one elastic member, there was also a problem that productive efficiency was low and a manufacturing cost became high.

[0007] An example is taken by this present condition. The top sheet of liquid permeability, and the backseat of liquid impermeability, The side flap which has the absorber arranged among said both sheets, and the circumference elastic body of two or more feet which extended outside from the longitudinal direction edges on both sides of said absorber. In the usage **** diaper which has the solid gathers arranged along with the absorber side edge on a side flap at the longitudinal direction said solid gathers By having the standing-up line besides the circumference elastic body of two or more feet of a side flap, and the circumference elastic body of a foot being arranged inside the standing-up line of said solid gathers The weir of the length-from-the-crotch-to-the-cuff section was made high that it is simple and substantially, and it used only not only in the length-from-the-crotch-to-the-cuff section, and resulted in the conclusion that it is possible to make it easy to stand the solid gathers of the whole **** diaper.

[0008] Moreover, the routing also became simple, productive efficiency was high, the manufacturing cost was low, solid gathers become easy to start, and it resulted in the conclusion of being effective, to leakage. Furthermore, it found out that the high solid gathers of the flattery nature to the circumference of a wearer's foot could be formed by choosing the weir of solid gathers as a monolayer, a multilayer, and freedom, preparing an elastic body in a free edge and choosing the location and number of an elastic body.

[0009] It is making it easy to start solid gathers simple by the elastic recoil of the circumference elastic body of a foot, and it is offering the usage **** diaper used suitably while the purpose of this invention makes the weir of solid gathers high, enlarges capacity of the pocket structure which solid gathers form and prevents leakage.

[0010]

[Means for Solving the Problem] The top sheet of liquid permeability [this invention], and the backseat of liquid impermeability, The side flap which has the absorber arranged among said both sheets, and the circumference elastic body of two or more feet which extended outside from the longitudinal direction edges on both sides of said absorber, In the usage **** diaper which has the solid gathers arranged along with the absorber side edge on a side flap at the longitudinal direction, said solid gathers consist in the usage **** diaper arranged by having a standing-up line besides the circumference elastic body of two or more feet of said side flap.

[0011] Solid gathers become easy standing up according to the shrinkage force of the circumference elastic body of a foot, the fit nature to a wearer's skin becomes good compared with the usage **** diaper which has the solid gathers which formed the standing-up line on the side flap inside the conventional circumference elastic body of a foot, and the leakage prevention effectiveness of the usage **** diaper which has the solid gathers which formed a standing-up line out of the circumference elastic body of a foot concerning this invention which has said configuration with which it adjoins on a side flap improves.

[0012]

[Embodiment of the Invention] The top sheets of liquid permeability used in this invention may be a hydrophilic property or a hydrophobic nonwoven fabric, textile fabrics, porous plastic film, etc., the bicomponent fiber which consists of two or more components, such as polypropylene, polyethylene, polyester, nylon or polyester, polypropylene, polyethylene, and nylon, is sufficient as the configuration fiber, and especially, although the bicomponent fiber of polyester/polyester, polyester / polyethylene, and polypropylene/polyethylene is desirable from a strong field, especially a limit is not received.

[0013] A top sheet does not need to consist of single sheets and may consist of sheets of two or more sheets, such as changing a sheet with an absorber top face and a flank flap. Moreover, in case a top sheet is constituted from a sheet of two or more sheets, although each sheet may use another material, the same material is sufficient as it.

[0014] The liquid impermeable backseat used in this invention consists of the material which sticks a nonwoven fabric, textile fabrics, etc. on liquid impermeable films, such as polyethylene, and the film of liquid impermeability and a nonwoven fabric with leakproofness, textile fabrics, etc.. there is especially no limit and the moisture in an absorber should not just ooze out on the diaper outside. Moreover, in order to give a blanket-like appearance, embossing processing may be carried out at the shape of a pattern, or lusterless finishing may be carried out further. Moreover, when using a film, though it is impermeability, it is still more desirable from using the well-known breathable film which makes only a steam penetrate, and preventing MURE.

[0015] The absorber used in this invention consists of curdy pulp, SAP, a hydrophilic sheet, etc.. and does not receive especially a limit. The absorber used in this invention is made from the well-known absorptivity ingredient with which the absorptivity goods of a conventional usage **** diaper and conventional others are usually used. That is, it is formed from the monolayer or the multilayer mat which consists of absorptivity fiber, such as curdy pulp and rayon, and is further covered with the hydrophilic sheet, and SAP is arranged by homogeneity into each mat and arranged in the shape of a layer between mixing or each mat. Moreover, after the absorber by which homogeneity mixing was carried out in SAP mixes 3 - 60% of the weight of the heat welding nature matter to curdy pulp, thermocompression bonding may be carried out or only SAP may be covered with the hydrophilic sheet.

[0016] It is a thing with a fiber length of 5mm or less obtained as curdy pulp by ****(ing) a chemical pulp sheet, a recycled pulp sheet, and a mechanical pulp sheet with a grinder. As a pulp raw material, not only a needle-leaf tree but a broad-leaved tree, a bamboo, straw, a bagasse, and a kenaf are applied. Although the amount of this pulp used differs by whether it uses independently, or two or more laminations are carried out and it uses with the target absorber, or other absorbers are used together, generally it is made into 50 - 400 g/m2.

[0017] As SAP, a starch system, a cellulose system, and a synthetic polymer system are mentioned. Namely, the saponification object of a starch acrylic-acid (salt) graft copolymer and a starch ethyl-acrylate graft copolymer. The saponification object of a starch METAKURU acid methyl graft copolymer, the saponification object of a starch acrylonitrile graft copolymer, The saponification object of a starch acrylamide graft copolymer, the saponification object of a starch acrylonitrile 2-acrylamido-2-methyl-propane-sulfonic-acid graft copolymer, They are the polyethylene oxide over which the bridge was constructed with the acrylic-acid (salt) polymer and the acrylic acid, the bridge formation object of sodium carboxymethylcellulose, the bridge formation object of a poly vinyl alcohol maleic-anhydride reactant, etc.

[0018] The urine, the body fluid, and water of 20 times or more of a self-weight are absorbed, and the thing of a sodium polyacrylate system is the most suitable from the point of absorptivity ability. the curdy pulp 100 weight section which dried the amount of distribution of SAP -- receiving -- the 10 - 500 weight section -- it is the 15 - 300 weight section preferably, and SAP of this amount is substantially distributed over curdy pulp at homogeneity. When SAP absorbed and swells, it is rare for a mutual interference to be able to minimize the particle. to contact continuously, and to form a permeability barrier, and it penetrates and absorbs urine and body fluid in the direction of a three dimension.

[0019] Hydrophilic sheets should just be sheets of a hydrophilic property, such as tissue, an absorbent paper, and a hydrophilic nonwoven fabric. You may be embossing of a pattern [that the consistencies of an absorber differ partially and urine and body fluid are led in a lengthwise direction and the direction of slant as the compression approach of an absorber with the roll whose peripheral surface you may have the shape of a field which continues so that the consistency of an absorber may become equal substantially over the whole with a roll with a smooth peripheral surface etc., and is concave convex] array. In embossing, a compression zone and the incompressible section may be continuation and discontinuous any. The configuration of an absorber is chosen as a rectangle, a sandglass mold, a T character mold, and freedom. is made, and any of the well-known configuration for which the absorptivity goods of a conventional usage **** diaper and conventional others are usually used are sufficient as it, and it is not limited especially.

[0020] Moreover, a diffusion layer may be prepared at least in the part on an absorber. It becomes possible to prevent leakage of urine, body fluid, etc.. without reducing the rate of absorption of urine, body fluid, etc. by establishing a diffusion layer, even when the space under a surface sheet is not fully prepared by a wearing person's posture etc. Diffusion layers are the nonwoven fabric of hydrophilic liquid permeability, textile fabrics, porous plastics, curdy pulp, etc., polypropylene, polyethylene, polyester, rayon, pulp, or these bicomponent fibers are sufficient as the constituent, and it does not receive especially a limit. A diffusion layer is arranged between a surface sheet and an absorber, and adhesion immobilization is carried out with adhesives etc. at an absorber.

[0021] The solid gathers used in this invention are formed with a sheet. The sheet for solid gathers formation may be formed by the top sheet on the top face of an absorber, and the side and backseat on the top face of a side flap. Furthermore, the sheet for solid gathers formation does not need to consist of single sheets, and the lamination of each [these] sheet is sufficient as it. Moreover, space may be formed in solid gathers in the case of the lamination of two or more sheets. the material of the sheet for solid gathers formation -- a

hydrophilic property or a hydrophobic nonwoven fabric, textile fabrics, porous plastic film, etc. -- or They are the films of liquid impermeability, and such lamination. The configuration fiber of textile fabrics and a nonwoven fabric Polypropylene, polyethylene, polyester, nylon The bicomponent fiber which consists of two or more components, such as polyester, polypropylene, polyethylene, and nylon, is sufficient. Or especially Especially a limit is not received although the bicomponent fiber of polyester/polyester, polyester / polyethylene, and polypropylene/polyethylene is desirable from a strong field. As for the sheet used for formation of solid gathers, it is desirable that it is leakproofness, for example, a water-repellent nonwoven fabric, the nonwoven fabric formed for super-thin fiber, its lamination nonwoven fabric with a film, etc. are desirable. Displeasure is not given to a wearer, without being steamed during diaper wear, since it has permeability if the liquid permeability sheet configuration of the flap sheet is carried out. Moreover, if a flap sheet is constituted from a liquid impermeable sheet, it will become effective to leakage.

[0022] Furthermore, according to the purpose of use, an elastic body may be installed in the sheet for solid gathers formation. If an elastic body is installed, a wearer's fit nature will also become high and the flattery nature to a motion of a wearer will also increase.

[0023] Although an elastomer film, a polyurethane film, elastomer form, polyurethane foam, natural-rubber-silk rubber, urethane yarn rubber, Taira rubber, a heat shrink nature film, etc. are used, the elastic body arranged in the free edge of solid gathers will not be limited especially if it is an elastic material. Moreover, these elastic bodies are arranged in the state of elongation at a solid gathers part, respectively, and adhesion immobilization is carried out with hot melt adhesive. As the adhesion fixed approach, what is necessary is just independent or the approaches that it does not separate even if it gets wet in urine etc. although there is an approach by such combination, such as an approach by hot melt adhesive, a heat-sealing joining method, and an ultrasonic welding method.

[0024] That it should just be arranged in the flank of a free edge, or its close relationship although one elastic body of solid gathers is arranged in the flank of the free edge of solid gathers, although only one may be arranged in each solid gathers, two or more elastic bodies may be arranged and are not restricted especially.

[0025] In the length-from-the-crotch-to-the-cuff section, the height of solid gathers is 10mm or more 100mm or less, and is 20mm or more 60mm or less preferably. On the other hand, the height of the weir of the solid gathers 11 in the back and an antinode flank is 0mm or more 80mm or less, and is 0mm or more 50mm or less preferably.

[0026] It is more desirable not to arrange the elastic body in the longitudinal direction both ends of the free edge of solid gathers. Moreover, since the longitudinal direction both ends of a free edge are parts equivalent to which an abdomen and regions of back are directly, solid gathers will be extremely inferior in a feeling of wearing, when it has not stood up, and it is [direction] desirable and solid gathers stand up in an abdomen and a regions-of-back field. Furthermore, the whole solid gathers may be formed with the sheet of a duplex that the width of face of the clinch of the side edge section of the flap sheet which forms the free edge should just be the width of face which can wrap the elastic body installed in inside. If the whole solid gathers are formed with the sheet of a duplex, leakproofness improves and it is still more effective to leakage.

[0027] Moreover, according to the shrinkage force of the elastic body with which the longitudinal direction central region which hits the length-from-the-crotch-to-the-cuff field of solid gathers was attached in the free edge, since solid gathers stand up up with a part for both the edges of an absorber from the end face section, they can form the pocket structure where capacity is large, and can raise greatest effectiveness to leakage prevention rather than it pushes down solid gathers inside simply. Furthermore, in order to raise the leakage prevention effectiveness, although it continues all over a longitudinal direction and pair arrangement is carried out along with the absorber side edge section, solid gathers do not necessarily need to be pairs and can also be arranged two or more sets.

[0028] The side flap used in this invention is formed from the backseat which extended outside from the edges on both sides of an absorber, and the sideseat by which the laminating was carried out on this, and the circumference elastic member of a foot is further arranged in the state of expanding between the backseat and the sideseat by circumference opening of a foot of a side flap. Although the circumference elastic body of a foot is arranged in a length-from-the-crotch-to-the-cuff part even if there are few diapers, in order for wearers, such as improvement in fit nature and leakage prevention, to wear it comfortably at this time, gathers may exist in the circumference of a foot at the perimeter. Moreover, although it consists of several lines which are not [that the circumference elastic body of a foot is parallel to mutual, or] parallel or can arrange a straight line or in the shape of a curve, in order to make fit nature with a crotch good, it is desirable to curve and arrange along with circumference opening of a foot.

[0029] Although sideseats may be a top sheet and allotropic material and may be different materials, it is still more desirable that it is water repellence as urine etc. does not ooze out from circumference opening of a foot.

[0030] The laminating lamination of a backseat and a sideseat is pasted up with hot melt adhesive. If a bead, a spiral, a melt blow, etc. are the approaches generally used, as for the method of application of hot melt adhesive, it is desirable to lessen effect on the elasticity by adhesives, and for it to be few in the possible range, and to apply the amount of the adhesives used to homogeneity all over a spreading side in any way, in order for the aesthetic property of the sheet after ***** to be good.

[0031] The circumference elastic body of a foot of a side flap is used according to an installation location in the thing of the shape of the shape of yarn, such as nature, synthetic rubber, and urethane, and a string, and a flat tip configuration. Arrangement of the circumference elastic body of a foot is fixed to a sheet by adhesives. As the adhesion approach, joining by water-soluble pastes, such as hot melt, a starch system, or CMC (carboxymethyl cellulose), fluid high adhesives or heat, a supersonic wave, etc. is sufficient.

[0032] The leakage prevention effectiveness can be made high by devising the expanding stress of the circumference elastic body of a foot of a side flap, and the elastic body attached in the free edge of solid gathers. Preferably, expanding stress of the circumference elastic body of a foot of a side flap is made stronger than the expanding stress of the elastic body attached in the free edge of solid gathers.

[0033]

[Example] Hereafter, although a drawing explains the usage **** diaper of this invention to a detail, this invention is not limited to these. It is the flat-surface development view of a usage **** diaper which is shown in drawing 1 . In drawing 1 The top sheet 2 of liquid permeability [diaper / 1 / usage ****], and the backseat 3 (refer to drawing 2) of liquid impermeability, It has the sideseat 5 arranged along the wrap top sheet 2 top in the absorber 4 from the side edge of the backseat 3 which extends outside from the edges on both sides of the absorber 4 arranged among both [these] sheets, and an absorber 4 (refer to drawing 2). Backseat 3 part which furthermore extends from the edges on both sides of an absorber 4, and top sheet 2 part and sideseat 5 part which are located on this are joined, and the side flap 6 is formed. In the length-from-the-crotch-to-the-cuff field of a diaper 1, the circumference elastic body 7 of two or more feet is arranged between the top sheet 2 which forms the side flap 6, and a backseat 3, and between the sideseat 5 and the backseat 3 (refer to drawing 2).

[0034] Moreover, the part located on the top sheet 2 of a sideseat 5 In the part which has pasted up with the top sheet 2 along with the longitudinal direction overall length of a diaper 1, and is further located on an absorber 4 in the edges-on-both-sides section of the top sheet

2 It was bent so that the side edge section might wrap in an elastic body 8, and longitudinal direction both ends have pasted up on the absorber 4 through a part for jointing 12. By this A part for jointing in the edges-on-both-sides section of the top sheet 2 is made into the standing-up line 9, and the solid gathers 11 which stand up up are formed by using as a free edge 10 the side edge which has arranged the elastic body 8 on an absorber 4.

[0035] Between the top sheet 2 which forms the side flap 6, and a backseat 3, in order to prevent the leakage of the exudate from the circumference of the foot under wear, the circumference elastic body 7 of a foot is arranged in the state of elongation. Furthermore, in order to prevent improvement in a feeling of a fit to a wearer's waist, and the leakage of the exudate from the circumference of the waist, the circumference elastic body of the waist is arranged in the side flap section of the back in the state of expanding. Moreover, in order to make a wearer do discharging arrival of the usage **** diaper simple, the FASUNINGU tape 13 is arranged in the side side flap 6 of the back.

[0036] In drawing 1, it does not need to be fixed, and may be fixed in part and the free edge 10 of the solid gathers 11 is not especially limited, although the longitudinal direction both ends are being fixed inside. Moreover, also in case it is fixed, the inside [line / 9 / standing-up] or an outside is sufficient. Moreover, the approach of fixing only one side and the approach of fixing one side inside and fixing another side outside may be used.

[0037] It uses and drawing 2 is the sectional view in the I-I' line of a **** diaper shown by drawing 1. In this case, the standing-up line 9 of the solid gathers 11 is located out of the adjoining circumference elastic body 7 of a foot, and the free edge 10 is further located inside a diaper from the standing-up line 9. That is, the solid gathers 11 are formed in the inner sense.

[0038] Drawing 3 indicates another example to be drawing 2. It is a sectional view in the I-I' line of the diaper shown by drawing 1. In drawing 3, the circumference elastic body 7 of four feet exists inside the standing-up line 9. Furthermore, as for the circumference elastic body of a foot, spacing is widely arranged for the direction inside an outside.

[0039] The circumference elastic body 7 of a foot of the side flap 6 which sets spacing to a longitudinal direction in a central region mostly, and is prolonged to a lengthwise direction is attached in the bottom of expanding to those die-length directions between the top sheet 2 or the sideseat 5, and the backseat 3. Although the expanding stress of the circumference elastic body 7 of a foot arranged at the side flap 6 has the same expanding stress substantially, the range of it is 0.9N-2.5N more preferably 0.4Ns - 3.0 Ns. When expanding stress is less than 0.4Ns, according to a motion of a wearer, it will be hard coming to fit a crotch, a clearance will be made, and urine and facilities will leak and come out. On the contrary, if expanding stress becomes large exceeding 3.0 Ns, although the effectiveness as an anti-leak barrier becomes high, in order to bind a wearer's thigh tight too much strongly, it gives a wearer displeasure and is not desirable.

[0040] Moreover, you may distinguish the expanding stress of the circumference elastic body of a foot between strength by the outside and the inside. By strengthening gradually reinforcement of the circumference elastic body of a foot located outside the reinforcement of the circumference elastic body of a foot located inside, solid gathers become easy to start, the weir of solid gathers becomes high, the capacity of the pocket structure which solid gathers form as a result becomes large, and the leakage prevention effectiveness improves. As for the expanding stress in this case, it is desirable to carry out strength of the expanding stress of the circumference elastic body of a foot which the range of is 0.8N-3.0N, and is located inside the standing-up line of solid gathers in the expanding stress of the circumference elastic body of a foot located outside the standing-up line of solid gathers in 0.4N-2.5N.

[0041] Moreover, the direction inside an outside may be made large for spacing of the circumference elastic body of a foot. By making large spacing of the circumference elastic body of a foot narrow and located [spacing of the circumference elastic body of a foot located outside] inside, solid gathers become easy to stand up according to the shrinkage force of the circumference elastic body of a foot, the fit nature to a wearer's skin becomes good, and the leakage prevention effectiveness improves. In this case, spacing of the circumference elastic body of a foot is [5 times / 1.1 times to] 3 times [1.5 times to] larger [the inside spacing] more preferably to outside spacing. When spacing of the circumference elastic body of a foot is the same, although the effectiveness as an anti-leak barrier becomes high, in order to bind a wearer's thigh tight too much strongly, it gives a wearer displeasure and is not desirable. On the contrary, if spacing inside a standing-up line becomes large exceeding 5 times, according to a motion of a wearer, it will be hard coming to fit a crotch, a clearance will be made, and urine and facilities will leak and come out.

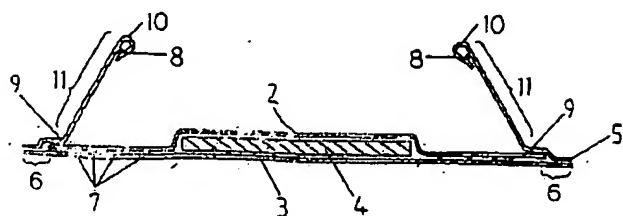
[0042] By drawing 4, another examples are indicated to be drawing 2 and drawing 3. The side flap 6 is formed of the top sheet 2 and a backseat 3, and the circumference elastic body 7 of two or more feet is arranged among both sheets. Moreover, the solid gathers 11 are fabricated by another member in the top sheet 2 or the backseat 3.

[0043]

[Effect of the Invention] As explained above, by arranging the circumference elastic body of a foot inside the standing-up line of solid gathers, solid gathers become easy to start by the elastic recoil of the circumference elastic body of a foot, the weir of solid gathers becomes high, the capacity of the pocket structure formed by solid gathers becomes large, and the usage **** diaper of this invention has a high leakproof effect.

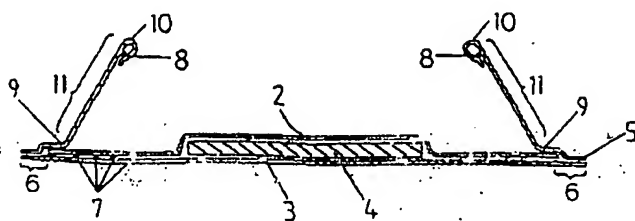
[Translation done.]

Drawing selection Representative drawing



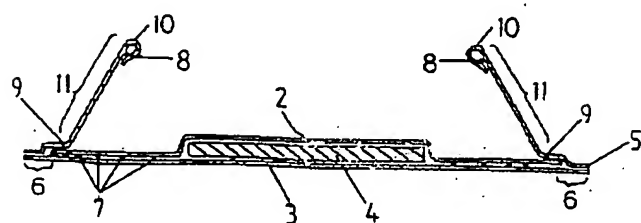
[Translation done.]

Drawing selection drawing 2



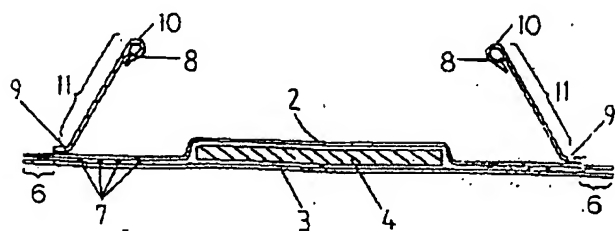
[Translation done.]

Drawing selection drawing 3



[Translation done.]

Drawing selection drawing 4



[Translation done.]

**This Page is Inserted by IFW Indexing and Scanning
Operations and is not part of the Official Record**

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

- ☐ BLACK BORDERS
- ☐ IMAGE CUT OFF AT TOP, BOTTOM OR SIDES
- ☐ FADED TEXT OR DRAWING
- ☐ BLURRED OR ILLEGIBLE TEXT OR DRAWING
- ☐ SKEWED/SLANTED IMAGES
- ☐ COLOR OR BLACK AND WHITE PHOTOGRAPHS
- ☒ GRAY SCALE DOCUMENTS
- ☒ LINES OR MARKS ON ORIGINAL DOCUMENT
- ☐ REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY
- ☐ OTHER: _____

IMAGES ARE BEST AVAILABLE COPY.

As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.